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Topic 19: FINANCIAL OUTLAY REQUIRED TO FORMULATE A CONTINENTAL PLAN
TO COMBAT TUBERCULOSIS

The Executive Committee at its 36th Meeting held in San Juan, Puerto Rico, October 1958, approved a resolution instructing the Director of the Pan American Sanitary Bureau to report to a future meeting of the Directing Council on the financial outlay which would be required to formulate a continental plan to combat tuberculosis.

Because of the lack of complete and accurate information in most countries, satisfactory determination of the prevalence and incidence of tuberculosis in the Americas is not possible.

The available data from mortality statistics of 1956 indicates that tuberculosis is among the principal causes of death in several countries. Data on annual reported cases of tuberculosis with rates per 100,000 population are provided in Table I and the numbers of death with rates per 100,000 population in Table II. These data are not complete since in many areas without sufficient medical facilities cases would not be diagnosed and reported and likewise not all deaths due to tuberculosis are certified as such due to incompleteness of medical certification. However, these data are useful in basing estimates with full recognition of the need for a study of the tuberculosis problem in a given country in order to plan a program to effect a rapid reduction in morbidity and mortality.

A marked decline was noted in mortality tuberculosis from around 1945 to 1955. However, in the last few years the rate of decline has not been as great. As stated as early as 1937 by Dr. Wade Hampton Frost ^{1/} the balance is against the survival of the tubercle bacillus. At this time when drugs have become available for effective treatment of cases and for protection of contacts, planning is advisable in order that effective programs may be formulated in each country as part of a continental plan to combat tuberculosis.

^{1/} Frost, W.H.: How Much Control of Tuberculosis? Am.J. Pub. Health 27: 759-766, Aug. 1937.

In 1958, approximately 100,000 cases were reported in Latin America with a population of 129 million; and 35,000 deaths for a population of 131 million. ^{2/} On the basis of these rates, there would be approximately 54,000 deaths and 156,000 cases in one year in the population of 200 million in Latin America. These figures indicate that about 3 new cases would be reported per death which give an approximation of the incidence.

In a country with a good case finding program approximately 11 active cases are known per death (prevalence). Using this ratio it is estimated that there may be 600,000 known active cases in Latin America. In addition, it is estimated that there may be two unknown cases for each known case or 1,800,000 unknown cases. In areas with good case finding approximately 5 cases are diagnosed and reported per death per year (incidence).

In formulating the tuberculosis program for the next decade, it is proposed to find and treat at least one half of the unknown active cases or approximately 900,000 cases and to extend case finding to the goal of 5 cases per death per year.

The financial outlay being planned is in addition to that already being spent for treatment and diagnosis of tuberculosis. The data from the Summary of Four-Year Reports on Health Conditions in the Americas ^{3/} indicates that over 20 million dollars were being spent for tuberculosis programs in 1957 although data were lacking for several large countries. It is expected that these existing programs include treatment of the known active cases and of 3 cases per death being diagnosed each year.

It is recognized that the programs of hospitalization and domiciliary treatment and care and case-finding will vary from country to country and likewise the costs for such programs.

The expansion being planned is for discovery and treatment of around 900,000 active cases (unknown at present) and of approximately 2 additional cases per death which will be found each year during the decade. This latter extension of finding these 2 additional new cases as they occur will give an additional 100,000 cases per year and one million in the decade. Thus the calculation of costs is based on discovery and treatment of 1,900,000 active cases.

Case Finding

It is estimated that it costs \$50 to find an active case of tuberculosis. This estimate will vary greatly in countries of the Americas.

^{2/} Countries or Territories with data available.

^{3/} Summary of Four-Year Reports on Health Conditions in the Americas, PASB, Sc. Pub. No. 40, 1958.

At \$50 per case, the cost of discovery of 1,900,000 active cases will be \$95,000,000.

Treatment

Approximately 10 per cent of the cases should be treated in a hospital for 3 months at \$4.00 a day. In this plan, hospital beds would be used for initial therapy, surgery and terminal cases. The cost at \$360 each for 190,000 cases would be \$68,400,000. Since 19,000 cases would be treated per year for 1/4 year, this treatment would require around 5,000 beds.

The cases treated in the hospital as well as the other 90 per cent would require on the average one year of domiciliary treatment (isoniazid and PHS) and follow-up at a cost of \$15.00 per month or \$180 per year. This includes the necessary X-ray films, laboratory examinations and home visits. The cost for this domiciliary treatment would be \$180 for 1,900,000 cases in the decade which is \$342,000,000.

Prevention

Each discovered case is considered to have 4 contacts, 2 tuberculin positive (3,800,000) and 2 tuberculin negative (3,800,000). This calculation may be low in areas with large family units and limited housing facilities.

Tuberculin positive contacts would receive 6 months of isoniazid and follow-up observations at \$5 per month for 6 months. Contacts of active cases are in general the most productive sources of new cases. The cost of this preventive program would be \$30 per positive contact and in all \$114,000,000.

Tuberculin negative contacts would receive BCG vaccination and one follow-up observation at the end of 6 months at a cost of \$2 each. The greatest justification to use of BCG is with contacts. The cost of this phase of the preventive program would be \$7,600,000.

Costs of clinics and hospitals are not included in this plan. It is believed that the existing facilities may be used with extension of domiciliary care and case finding as a part of health services.

Assistance of the Organization

The Organization is prepared to assist in several phases of the program, by consultant services in each zone and in training of personnel as follows:

1. Assistance for the establishment of national pilot area projects including prevalence surveys, case finding and treatment, and BCG vaccination. The purpose of these projects would be to establish a tuberculosis

control program in well defined areas covering a population of about 200,000 where general public services already exist.

The general objectives of these projects are:

a. To study the extent of the tuberculosis problem in the area and to provide a reasonably precise estimate of the prevalence and incidence of tuberculosis in the different parts and population groups within the area.

b. To establish a base line for future assessment of the tuberculosis control measures adopted in the area.

c. To study the various means and methods which have to be applied in order that the pattern of organized tuberculosis services can be usefully adapted to the local conditions, taking into consideration the actual possibilities of the country and the degree and development of the public health services.

d. To train national personnel locally.

e. To assess the costs of specific control measures and their relative value in reducing the extent of the tuberculosis problem on the country, as balanced against its financial realization.

2. Training of national personnel in the new techniques and procedures for the management of the tuberculosis problem. This type of training is already being carried out in a limited scale through the awarding of fellowships (short and long term) to selected key personnel.

3. Seminars on tuberculosis prevention will have as objectives the discussion of ways and means to utilize the new technical developments in the prevention of tuberculosis and the stimulation of action in country projects.

The Organization would wish to place emphasis on research which would grow out of the activities outlined in this proposal. The long-term case finding activities outlined here would lend themselves to many studies, especially in the field of home therapy which would be the central core of the plan. Our present knowledge now of prevalence and incidence is limited and needs to be extended.

Summary

The costs for this expanded program for 10 years are summarized below:

Case Finding	\$ 95,000,000
Treatment - Hospital	68,400,000
- Domiciliary	342,000,000
Prevention - Tuberculin positive contacts	114,000,000
- Tuberculin negative contacts	7,600,000
Assistance of the Organization	3,000,000
Total for 10 years	<hr/> \$ 630,000,000
Total for one year	\$ 63,000,000

Thus an additional financial outlay for an expanded tuberculosis program is estimated to cost around \$63 million per year. As in the programs of malaria eradication and for provision of water supplies, study of extent of the problem and local costs would be necessary to calculate the financial outlay in a country. However, with the extension of case finding, the use of domiciliary treatment and application of preventive measures, as described in this proposal, it is believed that substantial progress can be made in the next decade.

TABLE I

Number of Cases of Tuberculosis All Forms (001-019) with Rates per 100,000 Population
in the Americas, 1955-1960

Country	Number						Rate per 100,000 population					
	1955	1956	1957	1958	1959	1960	1955	1956	1957	1958	1959	1960
Argentina	16,577	18,307	19,647	16,508	...	...	86.7	93.9	98.9	81.5	...	...
Bolivia	859	745	596	522	1,779	1,136	26.6	22.7	17.9	15.5	52.1	32.8
Brazil (a)	10,883	11,556	13,735	7,986	14,079	b) 9,943	120.8	171.7	204.3	115.7	138.2	100.8
Canada (d,e)	9,184	8,405	7,979	7,502	6,579	6,345	58.6	52.3	48.2	44.1	37.7	35.6
Chile	*	*	*	*	*	*	*	*	*	*	*	*
Colombia (f)	12,273	11,048	13,787	14,579	13,858	14,392	110.8	93.0	114.6	119.3	110.9	112.7
Costa Rica	681	700	605	560	649	...	71.6	70.9	58.6	52.2	57.6	...
Cuba	1,749	1,951	1,838	1,177	1,849	1,856	28.5	31.2	28.7	18.1	28.0	27.5
Dominican Rep. (g)	1,799	2,149	2,184	2,199	2,189	2,122	71.2	82.2	80.8	78.6	75.6	70.4
Ecuador	4,542	4,466	...	...	...	5,223	123.1	117.5	...	...	...	121.5
El Salvador (f)	2,518	2,615	3,011	2,918	3,872	5,251	243.5	239.0	262.7	231.2	296.2	358.1
Guatemala	2,721	2,157	1,942	1,153	3,649	2,934	83.5	64.4	56.3	32.5	99.9	78.1
Haiti	799	779	1,188	2,218	3,067	2,860	24.2	23.3	35.1	66.5	88.5	81.6
Honduras	...	...	...	c) 1,439	d) 1,609	c) 4,566	...	...	...	78.7	85.3	234.2
Mexico	8,257	c) 9,421	c) 10,051	c) 10,801	d) 11,348	c) 12,417	27.8	30.9	32.0	33.4	34.1	35.9
Nicaragua	964	1,051	1,014	1,330	744	581	77.4	81.6	76.1	96.5	52.2	39.5
Panama	826	1,323	1,878	1,385	1,673	1,487	90.4	140.7	194.2	139.2	163.4	141.2
Paraguay (f)	640	1,158	1,381	1,206	1,126	1,113	89.4	124.1	135.3	107.6	98.1	94.7
Perú (f)	19,408	19,818	22,552	19,336	22,796	b) 19,485	472.9	450.3	472.8	397.5	425.3	348.4
United States	98,860	90,465	86,861	82,266	75,841	...	60.2	54.1	51.0	47.5	42.8	...
Uruguay	3,705	653	1,112	1,169	...	...	141.7	24.6	41.5	43.3	...	...
Venezuela (f)	8,699	8,062	7,211	7,494	7,887	8,722	260.4	232.7	200.3	201.2	204.4	217.7

... Data not available.

* Disease not notifiable.

(a) Federal District and State Capitals except: São Paulo 1950 and 1956-1958; Curitiba, 1950; Niteroi, 1955, 1957 and 1958.

(b) Provisional

(c) Tuberculosis of respiratory system (001-008).

(d) Excluding Northwest Territories. Including Newfoundland beginning July 1949. Including Yukon beginning January 1955.

(e) Newly reported active cases.

(f) Reporting area.

TABLE II

Number of Deaths from Tuberculosis with Rates per 100,000 Population
in the Americas, 1955-1959

Country	Number					Rate per 100,000 population				
	1955	1956	1957	1958	1959	1955	1956	1957	1958	1959
Argentina	4,786	3,844	...	...	...	25.0	19.7	...	...	...
Bolivia	a)1,184	...	...	...	...	a)37.4	...	...	...	...
Brazil (b)	...	4,026	2,742	2,438	...	...	67.1	93.3	80.4	...
Canada	1,382	1,256	1,183	1,027	959	8.8	7.8	7.1	6.0	5.5
Chile	4,530	4,129	4,110	3,776	4,073	67.0	59.5	57.7	51.7	54.6
Colombia	3,570	3,487	3,614	3,662	3,841	28.2	26.9	27.3	27.1	27.8
Costa Rica	220	198	217	158	163	23.1	20.0	21.0	14.7	14.5
Dominican Rep.	768	767	614	476	...	30.5	29.4	22.7	17.0	...
Ecuador (c)	1,213	1,313	1,420	1,454	...	32.9	34.6	36.5	...	...
El Salvador	456	363	404	428	380	20.8	16.0	17.2	17.6	15.1
Guatemala	1,311	1,439	1,272	1,306	1,207	40.2	43.0	36.9	36.8	33.0
Honduras	266	278	286	244	297	16.0	16.2	16.2	13.3	15.7
Mexico	7,708	8,434	9,494	*8,429	...	26.0	27.6	30.2	*27.6	...
Nicaragua	82	88	83	93	122	6.6	6.8	6.3	6.7	8.6
Panama	203	292	271	266	238	23.6	31.1	28.0	26.7	23.2
Paraguay	242	243	226	220	...	15.5	15.2	13.8	13.1	...
Peru (c)	3,463	3,827	4,522	3,829	3,182	36.9	39.7	45.6	37.5	30.2
United States	14,940	14,061	13,324	12,361	*11,730	9.1	8.4	7.8	7.4	*6.7
Uruguay	635	...	...	...	...	24.3	...	...	...	...
Venezuela (c)	1,932	1,723	1,731	1,547	1,466	33.4	28.9	28.2	24.5	21.9

(a) 1954.

(b) Federal District and State Capitals excluding city of São Paulo for 1950 and Federal District and seven State Capitals for 1956. Federal District for 1957 and 1958.

(c) Data are medically certified deaths only.

* Estimated.